CLAIMS

1. An inspection apparatus comprising:

a substrate having therein a structure for holding an inspected object;

an electromagnetic wave transmitting portion having an antenna structure for irradiating the inspected object with an electromagnetic wave; and

an electromagnetic wave receiving portion having an antenna structure for receiving the electromagnetic wave,

wherein the electromagnetic wave transmitting portion and the electromagnetic wave receiving portion are disposed in contact with the substrate.

2. The inspection apparatus according to claim 1, wherein an electromagnetic wave generated in the electromagnetic wave transmitting portion propagates through the substrate, and the electromagnetic wave receiving portion receives an electromagnetic wave which is changed when the inspected object is disposed in an electromagnetic wave propagation path.

3. The inspection apparatus according to claim 1, wherein the structure for holding the inspected object comprises a plurality of portions for holding the inspected object periodically disposed.

4. The inspection apparatus according to claim 1, wherein at least one of the electromagnetic wave transmitting portion and the electromagnetic wave

receiving portion comprises a negative resistance element.

5. The inspection apparatus according to claim 1, wherein at least one of the electromagnetic wave transmitting portion and the electromagnetic wave receiving portion is connected to a high frequency circuit via a waveguide for allowing an electromagnetic wave to propagate therethrough.

6. The inspection apparatus according to claim 1, wherein the electromagnetic wave transmitting portion and the electromagnetic wave receiving portion have a common structure and have both a function of transmitting an electromagnetic wave and a function of receiving an electromagnetic wave.

7. The inspection apparatus according to claim 1, wherein the electromagnetic wave is a terahertz wave.

8. The inspection apparatus according to claim 1, further comprising:

generation means for allowing the electromagnetic wave transmitting portion to generate an electromagnetic wave of a desired frequency band;

detection means for allowing the electromagnetic wave receiving portion to detect an electromagnetic wave propagated through the substrate;

a database for preliminarily storing physical

characteristics of the inspected object; and

an analyzing portion for collating an information to an electromagnetic wave detected by the detection means with an information stored in the database to inspect the inspected object.

9. The inspection apparatus according to claim 8, wherein the generation means is a laser oscillator.

10. The inspection apparatus according to claim 1, wherein the electromagnetic wave transmitting portion and the electromagnetic wave receiving portion are formed along a direction perpendicular to a thickness direction of the substrate.

11. An inspection apparatus comprising:

a substrate having therein a structure for holding an inspected object;

an electromagnetic wave transmitting portion having an antenna structure for irradiating the inspected object with an electromagnetic wave; and

an electromagnetic wave receiving portion having an antenna structure for receiving the electromagnetic wave,

wherein the electromagnetic wave transmitting portion and the electromagnetic wave receiving portion are integrated with the substrate.